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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/760,397

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Helmut Preisach

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EXAMINER

VAN ROY, TOD THOMAS

ART UNIT

PAPER NUMBER

2828

MAIL DATE

DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/760,397	Applicant(s) PREISACH, HELMUT	
	Examiner TOD T. VAN ROY	Art Unit 2828	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 12/07/07.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 5-11 is/are rejected.
- 7) ☒ Claim(s) 4 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

Applicant's arguments, see Remarks, filed 12/07/2007, with respect to the rejection(s) of claim(s) 1 under USC 102(b) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Umeda and Link.

The Examiner agrees with the Applicant that the Vcc side of the differential amplifiers is not outputting a signal to the laser diode in order to properly constitute differentially driving operation.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1, 7-8, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Umeda (US 6249178) in view of Link (US 5883910).

With respect to claims 1 and 7, Umeda teaches a circuit for driving a semiconductor laser comprising: a differential amplifier (fig.1 #Q1/2) for driving a semiconductor laser directly, and first (to anode) and second (to cathode) DC coupled outputs to terminals of the laser diode. Umeda does not teach one of the outputs to be AC coupled. Link teaches a similar driving circuit (fig.2) wherein an output from the differential amplifiers is connected via a capacitor to the cathode of the laser diode (AC coupled). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the driving circuit of Umeda with the AC coupled driving circuit of Link in order to provide a high pass filter allowing for sufficient headroom, and impedance matching to reduce parasitic effects (col.1 line 58-col.2 line 3).

With respect to claim 8, Umeda and Link teach the circuit and semiconductor laser can be disposed on spatially separated integrated circuits (fig.1, implying diode is available to be on separate chip due to extended transmission lines). Umeda and Link do not teach impedance matched lines of the circuit being provided for connecting the semiconductor laser to the circuit. It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the circuit of Umeda and Link with impedance matched lines in order to reduce parasitics present in the driving circuit, as is well known and widely practiced in the art.

With respect to claim 11, Umeda and Link teach the circuit outlined in the rejection to claim 1, including differential driving operation when an AC signal is applied, and single ended driving when a DC signal is applied (as all claimed circuit components

and characteristics have been disclosed by Umeda and Link, operation of the circuit in either AC or DC conditions would inherently result in the given outputs.

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Umeda and Link in view of Schrodinger et al. (US 2005/0025201).

With respect to claim 2, Umeda and Link teach the driving circuit as outlined in the rejection to claim 1, including the differential amplifier is connected to the second terminal of the semiconductor laser by means of a capacitor, but does not teach a coil and a resistor to be connected in series to ground between the capacitor and diode. Schrodinger teaches a driving circuit for a laser diode wherein a coil and a resistor are connected in series to ground between the capacitor and diode (fig.5 R2, L2). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the driving circuit of Umeda and Link with the coil and resistor connection of Schrodinger in order to attenuate the signal and compensate for parasitic capacitances (Schrodinger [0032]).

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Umeda and Link in view of Mukherjee (US 6226322).

With respect to claim 3, Umeda and Link teach the driving circuit as outlined in the rejection to claim 1, but does not teach the use of variable resistors connected in parallel with resistors of the differential amplifier. Mukherjee teaches a communications circuit in which parallel variable resistors are used with differential amplifiers (fig.15 Rf).

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the driving circuit of Umeda and Link with the resistors of Mukherjee in order to balance the amplifier gain as need for proper output (Mukherjee, col.28 lines 42-50).

Claims 5-6, and 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Umeda and Link in view of Giles (US 4612671).

With respect to claim 5, Umeda and Link teach the driving circuit as outlined in the rejection to claim 1, including the current inputs (fig.1 seen as the current source I1) but do not teach the use of analog to digital converters. Giles teaches a laser driving circuit that uses A/D converters (fig.1) at the inputs of the differential amplifier. It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the driving circuit, with current control, with the D/A converters of Giles in order to make the amplifier and current source controllable from an outside controlling chip (Giles, abs.).

With respect to claim 6, Umeda, Link and Giles teach the driving circuit outlined in the rejection to claim 5, and Giles additionally teaches the use of a microprocessor for executing a program to drive the circuit (Giles, abs.). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the driving circuit of Umeda, Link and Giles with the microprocessor of Giles in order to execute various programmable methods for controlling the laser diode.

With respect to claims 9-10, Umeda and Link teach the driving circuit outlined in the rejection to claim 1, but do not teach a method of controlling the laser under

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specified events. Giles teaches a laser driving circuit which controls the laser diode by: the circuit measuring characteristic curve data, determining a starting value from the data, the data being determined by varying the start up value as a function of a desired characteristic quantity of the laser (col.3 lines 15-30); and teaches performing the method on a periodic basis to monitor for faults (col.3 lines 59-65). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the laser driving circuit of Umeda and Link with the controlling methods of Giles in order to provide for routine maintenance checks of the diode, and to add a degree of automation to the system.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to TOD T. VAN ROY whose telephone number is (571)272-8447. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Minsun Harvey can be reached on (571)272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/TVR/

/Minsun Harvey/
Supervisory Patent Examiner, Art Unit 2828